WEST NILE VIRUS PROGRAM 2005:

Planning Document for Municipalities

April 2005

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PART 1 – INFORMATION FOR MUNICIPALITIES

1.0 – OVERVIEW – WEST NILE VIRUS

What is West Nile virus?

West Nile virus (WNV) is a relatively new disease in Manitoba. The virus is transmitted by mosquitoes. Most people who are bitten by an infected mosquito do not become ill and for those who do, the symptoms are usually mild. In some cases, the virus causes serious illness and sometimes death. Human cases of WNV were first detected in (southern) Manitoba in the summer of 2003, when 142 cases were identified. Of these 142 cases, 35 people had severe illness, including two deaths. In 2004, three human cases of WNV were identified, one with severe illness.

Most mosquitoes do not carry WNV. In Manitoba, the main carrier of the virus is the *Culex tarsalis* mosquito, which is usually less common than other mosquito types.
The risk of WNV varies from year to year. The risk is influenced by temperature, precipitation, mosquito populations, mosquito infection rates and many other factors. Manitobans are at highest risk of being bitten by a WNV infected mosquito in July, August and September.

What are the Symptoms?

Usually, people infected by West Nile virus have no symptoms and do not become ill. Of those who do become ill, most will develop West Nile fever, an illness with symptoms such as fever, headache, fatigue, and body aches. Less frequently, the virus can cause more serious illness (West Nile neurological syndrome), including encephalitis, an inflammation of the brain. Death may occur in some cases. People with pre-existing medical conditions, transplant recipients, and older adults are more at risk for developing severe illness. However, the illness has occurred in all age groups. Complications from WNV may include weakness, paralysis, confusion, coma or in some instances, death.

How is it spread?

People can become infected if they are bitten by mosquitoes that have previously bitten infected birds. Even when WNV has been identified in an area, most mosquitoes do not carry the virus.

There are other less common ways that WNV may be spread. Cases from blood transfusions and tissue transplants have been observed, but are rare. All donated blood is now tested for the presence of WNV. There is some evidence that pregnant women can pass the virus to their unborn babies and that the virus may be passed through breast milk. Bird to bird transmission is possible. There is also some evidence that poultry workers in Wisconsin exposed to a WNV outbreak among turkeys may have become infected with WNV.

2.0 – MANITOBA HEALTH PLANNING ASSUMPTIONS FOR 2005

- WNV will likely reappear in Manitoba in 2005.
- The overall anticipated morbidity and mortality from WNV is difficult to predict for 2005. There will likely be human cases in Manitoba. Weather patterns and surveillance indicators will help predict the risk during the course of the season.
- Rises in the trap counts of adult *Culex tarsalis* mosquitoes and mosquito infection rates corresponded to the time period of human case exposure to WNV in 2003 and 2004.
- Based on the analysis of the 2003 and 2004 human infection data, the greatest risk for exposure to WNV occurs in July, August and early September.
- Based on study of the biting habits of the *Culex tarsalis* mosquito, the greatest risk for exposure is between dusk and dawn. In the fall, they begin to bite earlier in the afternoon.
- Personal protection measures, such as applying insect repellant containing DEET according to guidelines and reducing time spent outdoors between dusk and dawn can be effective ways to minimize exposure to mosquito bites.
- *Culex tarsalis* mosquitoes lay their eggs on standing water. Reducing standing water around the home, even small amounts can reduce *Culex tarsalis* numbers.
- Larviciding prevents the development of the *Culex tarsalis* mosquitoes, but it is not always feasible to larvicide effectively in all areas.
- To be effective, larviciding for *Culex tarsalis* mosquitoes should begin mid to late June, (depending on weather conditions), and requires preceding mapping and larval sampling.
- Current information indicates that adult mosquito control can also be effective and safe when conducted according to Health Canada guidelines.

3.0 - WEST NILE VIRUS PROGRAM 2005: Provincial/Municipal Responsibilities

The overall goal of the West Nile Virus Program is to assess risk and take appropriate measures to limit the adverse impact on human health of WNV in Manitoba. Most of the components of the 2005 WNV program will remain the same as 2004, with some refinements based on the 2004 experience, feedback received, emerging information and national guidelines. The strategy will continue to include: public education, surveillance, risk assessment, and mosquito control. Information dissemination and communication will be organized through Regional Teams.

Five Regional Teams (RTs) will operate consistent with the boundaries identified in 2004. The main purpose of these teams is to disseminate and communicate WNV related information between government, Regional Health Authorities (RHAs), municipalities, and other involved partners. *Regional Coordinators (RCs)* will lead the teams and act as a primary contact person

for regional WNV issues. RTs will have representation from relevant RHAs, the departments of Manitoba Agriculture, Food and Rural Initiatives, Manitoba Conservation, and Manitoba Intergovernmental Affairs and Trade. Municipalities and First Nations Communities are welcome to participate. Appendix A on page 13 of this document provides a map of the Regional Team areas.

Regional Coordinators for the team areas are as follows:

Region	Name	Phone Number
Winnipeg Region (Winnipeg RHA area)	Deborah Chochinov	788-6795
Western Region (Westman, Parkland, Brandon RHA area)	Lena Hozaima	788-6779
Central Region*		
Central RHA Area	Lena Hozaima	788-6779
Interlake RHA Area	Deborah Chochinov	788-6795
Eastern Region	Deborah Chochinov	788-6795
Northern Region	Lena Hozaima	788-6779

Note change from 2004 - there are now two regional coordinators covering this area

The success of a program aimed at protecting citizens from new and emerging disease requires strong partnerships between municipal, provincial and federal governments, as well as the public. Municipalities play key roles in supporting the planning and implementation of these activities. The following sections provide a description of provincial and municipal roles in regards to WNV. ***(A quick checklist of municipal responsibilities appears in Appendix B on page 14.)***

3.1 - SURVEILLANCE ACTIVITIES:

The province has a number of surveillance activities to assess risk to human health, communicate the risk and make recommendations for appropriate response to the risk. Surveillance for mosquitoes includes targeted mapping of potential mosquito larval habitats, larval sampling, and adult mosquito trapping. Surveillance systems are in place to detect the presence of WNV in dead birds from the corvid family, in horses, and in humans.

A *Field Surveillance Coordinator* will oversee five *Field Surveillance Teams* who will be responsible for the operational aspects of surveillance activities including dead corvid pick up,

mapping and larval sampling, and adult mosquito surveillance. Field Surveillance Teams will work in close contact with municipal staff. City of Winnipeg personnel will undertake surveillance activities within the City of Winnipeg area.

A central coordination unit in the Office of the Chief Medical Officer of Health, Manitoba Health, is managed by the *Provincial Coordinator of New Public Health Programs* and supported by others including the *Consulting Entomologists*. This unit has the expertise and capacity to obtain and analyze information and data, to recommend provincial, regional, and municipal actions and to support the assessment of human risk by the *Chief Medical Officer of Health.*

Corvid Surveillance

Testing of dead crows and other corvids provides an early indication of the presence and geographic distribution of WNV in Manitoba. This program will begin in mid-May; an official announcement will indicate the exact day.

The public is asked to report to Health Links recently dead corvids, (crows, blue jays, ravens, and magpies), for laboratory testing for WNV. Other factors that will be considered by Health Links include type and condition of bird.

If appropriate, arrangements will be made to pick up the bird for testing. Health Links may offer alternative advice, including precautions that should be taken to handle a dead bird safely, including:

- Not touching the dead bird with bare hands
- Taking care not to scratch or puncture skin while handling the bird
- Using a shovel or a plastic bag to pick it up
- Disposal of the bird with regular household trash
- Promptly washing hands well with soap and water.

After the first bird has tested positive within a Regional Health Authority area, no further birds will be picked up in that area. Municipalities are asked to reinforce the message that not all reported birds will be picked up for testing.

For further detail on how to dispose of dead birds and small animals, please refer to our website at http://www.gov.mb.ca/health/

Mapping

Mapping is important in identifying, describing, and keeping an inventory of potential *Culex tarsalis* mosquito habitats for planning and response purposes. Mapping is normally a prerequisite for larval sampling and subsequent larviciding (if appropriate), as it provides accurate and efficient targeting of mosquito control efforts.

Field Surveillance Teams will be updating maps in and around selected communities in southern Manitoba. Communities are selected based on several considerations including human population size and density, geographic considerations and historical or current WNV surveillance data.

Municipalities will be asked to participate in mapping activities in the following ways:

- Consent for mapping activities to occur within their jurisdiction
- Provide contact information for municipal personnel with expertise regarding local standing water sites of the type that may produce *Culex tarsalis* mosquitoes (on both public and private lands) so that this information can be provided to the Field Surveillance Teams when they visit the area
- Provide access to the Field Surveillance Teams to existing local mapping information, as necessary and available
- Identify areas where concerns regarding mosquito control have been expressed to them
- Assist in gaining permission to access private lands with standing water sites where *Culex tarsalis* may lay their eggs

Municipalities are encouraged to begin assessing and recording potential mosquito habitats in the municipality, such as tire recycling depots or other known sites of standing water on both public and private lands. This information should be provided to theField Surveillance Teams.

<u>Larval Surveillance</u>

Larval surveillance comprises sampling of mosquito larvae from permanent or semi-permanent water and identifying those larvae of the species that are known to carry WNV. Larval surveillance typically precedes larviciding for the following reasons:

- It estimates the potential number of mosquitoes that can transmit WNV that are present in a given location, and thus indicates risk;
- It establishes best times for application of larval control measures; and
- It helps to evaluate the effectiveness of control measures.

Field Surveillance Teams will begin early season larval sampling in mid to late June. Larval sampling to identify *Culex tarsalis* larvae will occur with the permission of the municipalities in public areas of communities that have been assigned priority for mosquito surveillance. The purpose of this early season larva sampling is to identify the initial presence of *Culex tarsalis* larvae in communities in southern Manitoba. ***Once confirmed that Culex tarsalis larvae is present in communities in southern Manitoba, municipalities that have been approved for cost shared funding will be alerted to begin their larviciding program.*** Further information on this is provided in the Cost share funding application component of this package.

After Culex tarsalis larvae is initially identified, as part of an ongoing larviciding program, municipalities are expected to sample larvae (i.e. "dip" for larvae) and confirm the presence of larvae prior to applying larvicide. They are also expected to dip for larvae after applying larvicide to evaluate the effectiveness of larvicide (See Appendix C on page 15 for larva sampling guidelines and a template for logging larva sampling and larviciding activities.)

Throughout the season, Field Surveillance Teams will monitor larvae within communities to assess larviciding activities and will assist municipal staff in doing quality assurance, (i.e. assessment of effectiveness of larval treatments). The completed logs will assist municipal and Field Surveillance personnel in this process. ***Municipalities are required to submit completed templates to Manitoba Health at the end of the season for purposes of broad analysis.***

It is important for municipal staff to participate in mapping and larval sampling to build local capacity for these activities. Field Surveillance Teams will work with municipal staff to enhance skills in this area.

Adult Mosquito Surveillance

In 2003 and 2004, adult mosquito surveillance provided valuable indicators of the risk of WNV to human health. Adult mosquito surveillance includes trapping of adult mosquitoes and testing for the presence of WNV.

Permanent traps will be set again this year in approximately 30 communities in southern Manitoba. Information gathered from adult mosquito trap surveillance (i.e. numbers of infected *Culex tarsalis* mosquitoes) will help to estimate the current risk of infection for humans in that community or similar communities in the vicinity.

All communities where permanent adult mosquito traps were set in 2004 will have mosquito traps set up in 2005 so that analysis of year to year trends can occur. Factors considered in selecting these communities for adult mosquito surveillance include:

- Population density
- Historical/current evidence of WNV
- Geographic distribution throughout southern Manitoba

If adult mosquito surveillance is undertaken in an area, local assistance will be needed to find or re-confirm appropriate sites for setting such traps. Ideal trap sites within a community would be those that:

- Are within a fairly open space with some bushes and trees, however not densely treed. Preferably at the edge or interface between shrubs/trees and open areas.
- Are secure from interference by the public either in a fenced (short) enclosure, (e.g. a back yard), or out of normal public view and at least 30 feet away from buildings.
- Are away from competing light sources such as yard lights.
- Are in a sheltered location out of wind and free from dust or other pollutants.

- Are easily accessible to Field Surveillance Teams.

Freezer space for temporary storage of dry ice blocks, (solid carbon dioxide), within portable coolers for mosquito storage and preservation would be useful if available locally.

Equines

Manitoba Health will continue to receive information related to equine testing from the Veterinary Services Laboratory, Manitoba Agriculture, Food and Rural Initiatives. If a citizen has concerns with regard to WNV and horses, they should contact their local veterinarian.

Humans

Surveillance for human cases of WNV is ongoing. Cadham Provincial Laboratory will analyze specimens received on human cases and will also test organ and tissue donations. The Canadian Science Centre for Human and Animal Health will do confirmatory testing. Manitoba Health and Canadian Blood Services are collaborating to promote the safety of the blood supply.

3.2 - MOSQUITO CONTROL

Appropriate actions regarding insect control – whether source reduction, larviciding or adulticiding - may vary, depending on assessment of local circumstances.

Source Reduction:

Mosquito larvae need standing water to develop. Reducing unnecessary standing water will reduce the numbers of *Culex tarsalis* mosquitoes. Manitoba Health will be providing information to the public with regard to how to reduce standing water around the home. Efforts should be made to reduce standing water where mosquitoes may develop on municipal property. Equipment, containers, old tires, etc., can collect water and breed mosquitoes. Large piles of tires may need to be moved and/or covered or larvicided. Manitoba Conservation should be consulted if changes to drainage are contemplated. For more information visit the Manitoba government web site at www.gov.mb.ca/health and click the West Nile virus link to access the fact sheet *Reducing Mosquito Numbers Around Your Home.*

Larviciding

As in previous years, a 75% provincial/25% municipal cost-shared program is in place for 2005. Applications are assessed and if appropriate, funding is approved for larviciding activities. An application package and guidelines appears in PART II of this document. Larviciding may not be feasible or effective in all communities/municipalities. Your Regional Coordinator, in consultation with the WNV Consulting Entomologist will be able to assist in determining this.

Mosquito larvicides kill mosquitoes during the larval stage of a mosquito's life cycle. *Bacillus thuringiensis israelensis* (*Bti*), a bacterium found naturally in soils, is the recommended larvicide

in Manitoba. *Bti* is registered through Pesticide Management Regulatory Association (PMRA) of Health Canada. It causes minimal impact to the environment and other insect and animal species. Other larvicides are also available for specific mosquito control situations. For further information on *Bti* and other registered larviciding products, visit the PMRA web site at www.hc-sc.gc.ca/pmra-arla.

Larvicide may be applied by hand held equipment, backpack, truck mounted sprayers, or aerial depending on the geographic characteristics of the area being sprayed. The main considerations for larviciding include:

- Proximity of appropriate, accessible bodies of water within **3 km** of dense human population
- Specific characteristics of bodies of water (non-flowing, organic material, sun exposure, etc.) which determine the probability of *Culex tarsalis* mosquitoes being present
- Time of year and expected life cycle of *Culex tarsalis* mosquitoes (usually not before mid to late June)
- Presence of significant numbers of *Culex tarsalis* larvae in the water (larval sampling results)
- Evidence of WNV in the area (previous or current surveillance and information from corvids, horses, etc.); and
- Estimated risk for anticipated human infection.

Municipalities are encouraged to post signage prior to larviciding treatments at water sites easily accessible to the public. This lets the public know that a larvicide will be applied and is a good public relations activity.

Adult Mosquito Control

Adult mosquito control is the application of pesticide to kill adult mosquitoes. In situations where a public health threat is considered imminent or immediate, (e.g. numbers and infection rates of adult mosquitoes are high; time of season; size of geographic area, weather conditions, access and feasibility, etc.), mosquito adulticiding may be appropriate.

Mosquito adulticide may be applied either by ground based or aerial equipment. Adulticides typically are applied as an Ultra-Low-Volume (ULV) spray where small amounts of insecticide are dispersed either by truck-mounted equipment or from aircraft. The rates of active ingredient per acre or hectare applied are lower than those typically used to control pests on agricultural crops. At this time, the only registered product for adulticiding that has undergone a recent evaluation by the PMRA is Malathion. For further information on Malathion, visit the PMRA web site at www.hc-sc.gc.ca/pmra-arla.

The main considerations for adulticiding include:

- Anticipated imminence of significant human risk based on surveillance and other data
- Human density and population numbers
- Weather conditions, including temperature, rain, and wind, and

- Time of year
- Life cycle of *Culex tarsalis* mosquitoes.

In the event that a health emergency appears imminent, a Ministerial Order pursuant to the *Environment Act* may be issued to implement adult mosquito control. In this case, the cost-share funding formula applies. The order will specify direction as to the area that is to be included in the control program, the pesticide to be used, requirements related to public notification, etc. Communication will occur between Regional Team Coordinators and municipalities as soon as possible, if a Health Order is being considered.

Communities that undergo adult mosquito control are required to provide advance notice to the public at least 24 hours prior to the commencement of mosquito adulticiding. The public notice must identify the pesticide products to be used in the program and when the program will begin. The Province will work with municipalities on these requirements.

Provincial Mosquito Control Equipment

Municipalities that are approved for cost shared funding for mosquito control may gain access to certain types of equipment (i.e. truck mounted larviciding applicators; ULVs for adult mosquito control) from one of the Mosquito Control Centres in Winkler and Brandon by making arrangements through their Regional Team Coordinators. There is also some equipment located within Winnipeg that is available for use by municipalities. The community will require trained staff with pesticide applicators licenses and the required permits to access this equipment. Availability of the equipment will depend on scheduling needs.

Licensing, certification, and permits

Municipalities must obtain a pesticide application permit for larviciding and/or adulticiding. For information on permits, municipalities should contact Ken Plews, Manitoba Conservation at (204) 945-7067.

In addition, personnel who will be doing the mosquito control will need to be certified and licensed. Pesticide Certification and Licensing is a two-part process: Certification through Assiniboine Community College (ACC), and Licensing through Manitoba Agriculture, Food, and Rural Initiatives (MAFRI). MAFRI requires re-certification every five years. For information on licensing, please contact Rhonda Kurtz at (204) 945-7706.

All Pesticide Applicator/Dispenser Certification candidates must pass a Pesticide Core certification exam and a category certification exam (customized specifically for mosquito control). For more information on the certification process, please contact Mr. Terry Waddell, Program Coordinator at ACC at (204) 725-8700 ext. 7116.

All pesticides used or sold in Canada must be registered by Health Canada's Pest Management Regulatory Agency (PMRA). Before registration, each product undergoes an extensive scientific assessment to determine that it poses no unacceptable risks to human health or the environment, and the product's efficacy.

Mosquito control on private property

Ideally, a comprehensive mosquito control program would include access to private property for surveillance and response purposes. Access to private property may be important to ensure the effective control of mosquitoes within a community. Focusing only on public property potentially leaves large areas of untreated standing water and larval habitats.

Municipalities may gain access to private property by receiving permission from the property owner. Alternatively, municipalities may develop a mosquito control by-law, which would include authorization for designated staff to have access to private property for inspection purposes.

In particular, communities may want to consider access to properties that are known to have standing water and potential larval habitats, (e.g. tire disposal collection and re-cycling sites).

Special Interest Groups:

Some individuals may have health concerns regarding adult mosquito control. In addition, some insecticide applications may have a negative impact on bees kept by beekeepers, forage seed producers, and organic produce.

In the event of adult mosquito control measures, notification of the public in the area will occur. Efforts will be made to notify individuals who have made their concerns known to the municipalities or the provincial program.

3.3 - EDUCATION AND COMMUNICATIONS

The Office of the Chief Medical Officer of Health is responsible for the public education campaign that provides information on the use of personal protection measures to reduce exposure to mosquitoes. The campaign will include pamphlets, posters, fact sheets, website, media bulletins, print and radio ads. The key messaging to the public is two-fold:

Source Reduction: A public education and communication campaign to encourage Manitobans to keep their private property as free as possible of habitats for *Culex tarsalis* larvae.

Citizens should be encouraged to reduce standing water that may collect in backyards, including pools from over-irrigation, old tires, children's toys, pet bowls, wading pools, stagnant ponds, or in flower pots.

Personal Protection: A public education and communication campaign focused on providing information to people about ways in which they can personally protect themselves and reduce the risk of being bitten by WNV infected mosquitoes.

Information should be provided to the public on how to reduce their exposure to mosquito bites through the following activities:

- Using mosquito repellant with DEET;
- Reducing the amount of time spent outdoors between dusk and dawn; the peak mosquito hours are around dusk and dawn but *Culex tarsalis* mosquitoes will also bite during the night, or on cloudy, overcast days;
- Wearing loose fitting, light colored, long sleeved tops and long pants when outdoors; and
- Making sure that door and window screens fit tightly and are free of holes.

The Manitoba government's website at http://www.gov.mb.ca/health/ will be updated regularly with the latest information on WNV. WNV media bulletins will be distributed as required.

Monitoring New Information on WNV

Program staff regularly participate in national teleconferences and committees, and keep track of emerging information to keep informed about current developments and new information on WNV.

First Nation Communities

The Province is working with First Nations and Inuit Health Branch of the federal government and First Nation communities regarding WNV program activities. Information outlining the WNV program will be sent to First Nation communities.

Sharing of Surveillance Information

Manitoba Health recognizes the importance of sharing provincial surveillance information with municipalities for planning and response purposes. Mapping, larval, adult mosquito, and equine information will be shared with municipalities by their Regional Team Coordinator in as timely a manner as possible. Municipalities with the first positive bird in a health region will be notified.

Human case information by Regional Health Authority location will be reported to the media and will be available to the public on the Manitoba Health website. Municipalities will be informed if there are human cases that were likely *exposed* in their municipality. Determining the most likely place of exposure may take several weeks to investigate thoroughly, therefore there may be some delay in providing this information to municipalities.

4.0- OTHER MUNICIPAL ACTIVITIES

Identifying the Local Team

Municipalities will be asked to identify their lead contact person to Manitoba Health. This person will be contacted by WNV Program staff throughout the season on matters related to WNV. They should provide a means of contact for after hours, (evenings and weekends) in the

event that emergency communication is required. A back-up plan for key contacts during holidays or absences should be in place.

Key individuals should be identified to be part of the municipal team to coordinate the local response activities in the event WNV activities need to be considered.

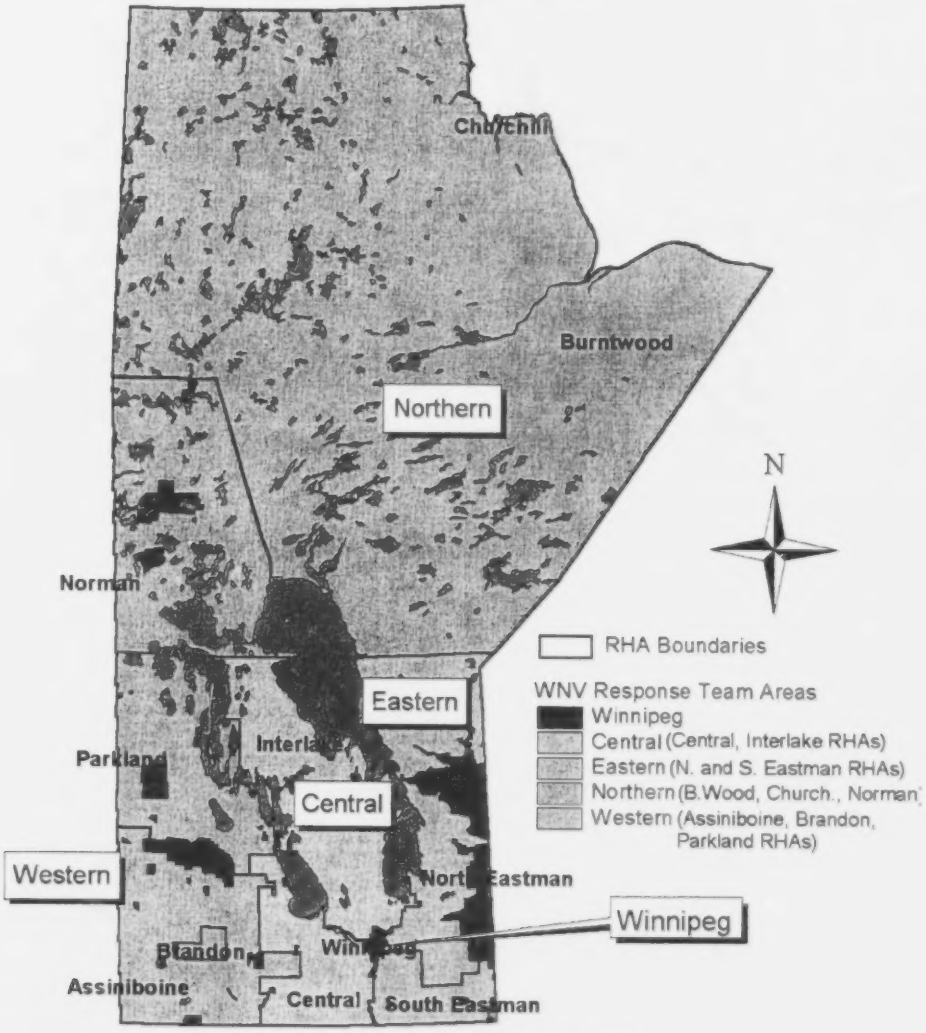
Plan for media interest. Media calls about health issues related to WNV within a municipality should be referred to the Regional Medical Officer of Health. Calls regarding local response issues should be handled by the municipality. Media calls regarding the provincial program or provincial human health issues will be handled by the Office of the Chief Medical Officer of Health (204) 788-6666. Media calls about horse health related to WNV should be referred to the Provincial Veterinarian (see Key Contact list, page 19).

Public access to information about WNV should be available in a timely fashion. Municipalities should determine ahead of time how to handle a large volume of calls from the public, and heightened demand for information. Public inquiries can be directed to Health Links who have the information and staff to respond in a timely manner. Health Links staff can be reached at 788-8200 in Winnipeg, or 1-888-315-9257 outside Winnipeg. The Manitoba Website has current information for the public. Pamphlets and posters will be distributed to municipalities.

A Key Contact List is provided in Appendix D on page 19. See the Manitoba Health website at http://www.gov.mb.ca/health/ for more information, including links to other websites. The website will be updated regularly with the latest information on WNV. Please refer to the website as the season approaches, to ensure your municipality is up to date on current issues and new developments of the WNV program.

APPENDIX A

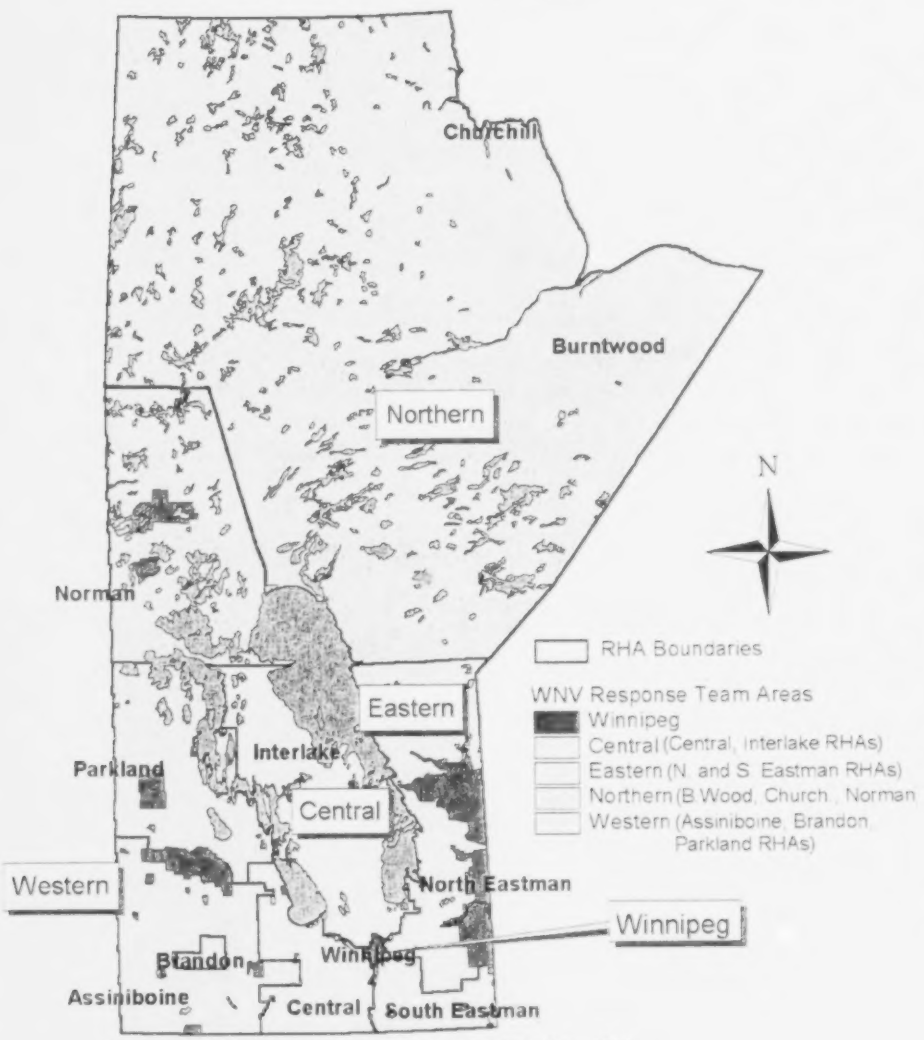
West Nile Virus Regional Response Team Areas



Prepared by Chris Green, Public Health Branch, May, 2003

APPENDIX A

West Nile Virus Regional Response Team Areas



Prepared by Chris Green, Public Health Branch, May, 2003

APPENDIX B

MUNICIPAL ROLES AND RESPONSIBLITIES
Quick Check list

- ☐ Identify a WNV lead contact person(s), as well as a back-up contact, to your Regional Coordinator, who will be available on a regular basis during the WNV season.

- ☐ Encourage the reporting of dead corvids to **Health Links (788-8200)** in Winnipeg, or outside Winnipeg, toll-free at **1-888-315-9257**. Remind citizens that not all birds will be picked up for testing.

- ☐ In municipalities where adult mosquito trapping is undertaken, assist in locating appropriate sites for adult mosquito traps.

- ☐ Where mapping is being undertaken, provide Field Surveillance Teams consent to perform mapping activities within the municipality's jurisdiction and assist in getting consent from private property owners as required.

- ☐ Where mapping is being undertaken, assist Field Surveillance Teams in identifying standing water such as wetlands, sensitive sites, private property, farmland, and other features that could impact pesticide applications; provide contact information of municipal personnel with expertise regarding local standing water sites to assist Field Surveillance Teams in mapping activities.

- ☐ As appropriate, develop a larviciding plan and submit an application for cost shared funding.

- ☐ Review all the required Environmental Conservation Laws related to pesticide use and ensure all licenses and permits are in place.

- ☐ Keep a log of larval sampling and larviciding activities and submit to Manitoba Health at the end of the season.

- ☐ Reduce standing water on municipal property, where feasible.

- ☐ Remind residents and businesses within the municipality of their role in effective mosquito control (ex. eliminating mosquito larval habitats, draining shallow ponds or puddles, usage of mosquito repellant, etc.)

- ☐ Liaise with your applicable Regional Coordinator regarding questions about West Nile Virus and the West Nile Virus Program.

APPENDIX C

LARVA SAMPLING/LARVICIDING GUIDELINES/LOG

Culex tarsalis larval habitat

Culex tarsalis has a wide range of habitats in grassland and open woodland areas, usually in warmer water areas exposed to the sun. In the spring, small numbers of *Culex tarsalis* larvae usually can be found in shallow, permanent and semi-permanent ponds, irrigated areas and weedy roadside ditches. However as populations build during the summer, larvae may be found in temporary water bodies, including artificial containers, water-filled hoof prints near livestock watering sites, bird baths, used tires and foul water in corrals and around feedlots.

Monitoring for Mosquito Larvae

Testing or monitoring for the presence of mosquito larvae in standing water is a critical "first step" in any mosquito control program. Biological larvicides such as Vectobac or Aquabac will not work unless there are mosquito larvae at a certain stage of development present. Testing for mosquito larvae is usually done with a dipper which has a handle about 3' long with a white cup or dipper attached to the end. There are commercially made dippers available, but you can make your own using a 3' long dowel with a white plastic container (500 g yogurt containers work well) attached to the end. The old white enamel dippers that were used on the farm in the past are excellent – but are hard to find.

Performing a Dip

When you are searching for mosquito larvae it is important to not disturb the larvae that may be on the water surface. Mosquito larvae will quickly swim to the bottom of the water body or hide under vegetation or other debris if disturbed.

- When approaching a water body, move slowly and carefully. Vibrations from your footsteps, disturbing the vegetation or your body casting a shadow over the water can be enough to cause larvae to dive to the bottom.
- Mosquito larvae of the *Culex tarsalis* genera are typically found on the surface of the water and usually next to vegetation or surface debris. In larger bodies of water, they are found in more shallow water areas with vegetation, such as grasses and sedges present. These are along the edge of larger water bodies. Mosquito larvae are not typically found in the more open deeper water areas where there is excessive wind and wave action.
- Dipping should be concentrated in areas where there is vegetation or floating debris.
- If there is a strong wind, dipping should be done on the downwind side of the water body where the larvae and pupae may be concentrated.
- Dipping for mosquito larvae is not effective if it is raining.

Dipping Techniques[1]

Complete Submersion and Simple Scoop Method

- A "dip" is made by quickly scooping a dipperful of water. Mosquito larvae such as *Culex tarsalis* are frightened easily and will try to avoid the dipper, if the dip is taken too slowly; therefore it is important that a dip be done quickly.
- Quickly plunge the dipper below the surface of the water, and then bring back a "scoop-full" of water; avoid over-filling as the larvae may be lost in the overflow.
- This is the most common way of performing a dip.

Partial Submersion and Flow-In Method

- This method is used when you need to test for larvae at the edges of vegetation in shallow water.
- Push the dipper, tilted at approximately 45°, straight down into the mud and beside clumps of grasses or sedges. This causes the water around the vegetation to flow into the dipper, carrying the larvae with the flow. There is no need to move the dipper and make sure to pull the dipper up before it is full.

Scraping Method

- Used to collect larvae that are hiding under floating or other vegetation, such as cattails.
- Dip from the water towards the vegetation and then using the dipper to scrape up against the base or underside of the vegetation to dislodge the larvae.
- This method can be more effective if the bottom of the dipper is screened.

Treating Larvae

Once you have determined that there are mosquitoes present in a water body, you can now treat that area with the biological control agent, *Bacillus thuringiensis var. israeliensis* or *B.t.i.* for short (Vectobac or Aquabac). These products come in either a liquid or granular form. The liquid can be applied with conventional spray equipment and is suitable for open water bodies, such as roadside ditches in the spring. However, when there is thick vegetation present by late spring or summer, the granule form is preferred as it falls through the vegetation to the water surface. *B.t.i.* granules can be applied by hand using a pail and a scoop or by small hand-held grass seed or fertilizer spreaders if the water body is small. If a water body is too large to be treated by hand, then a backpack blower can be used.

- *B.t.i.* is the most effective when the larvae are in the 2nd and 3rd instar or development stage. It does not work on pupae.
- Apply at rates recommended on label. The application rate for all methods averages 5 – 10 kg/ha. (approx. 4.5 – 9 lbs/ac.) or 1g/m.
- Use in temporary pools in pastures and woodlots, irrigation or roadside ditches, natural marshes, catch basins and sewage lagoons.

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[1] C. O'Malley, *Wingbeats*, Winter 1995, p.24

- Use higher rates in deep, very cold water, and/or polluted water, and when late 3rd or 4th instar larvae predominate.

When to treat

The following table gives an estimate of larval density and can be used as a guide for treating or not treating a water body[2]. The counts are based on taking 10 dips taken around and close to the vegetation edge of the water body. At each "dip" the mosquito larvae are counted.

Density	**Low**	**Medium**	**High**
No. larvae in 10 dips	1-4	5-60	>60
Treatment required	No *	Yes	Yes

*Treating a site with low numbers depends on size. If it is small, then you can treat it. If the water body is large, then treatment is not cost-effective

Larva sampling of sites should be completed each week. Typically, larval treatment at any given site using *Bti* will need to undertaken on average every two weeks.

[2] Based on guidelines from the City of Winnipeg, Insect Control Branch

Mosquito Larvae/Larviciding Log

Municipality: _____

Site ID[3]	Approx Area size	Description of Larval Habitat[4]	Temporary, Permanent, Semi-permanent[5]	No of larvae/dip	Date Dipped	Larvicided (Yes/No)	Date Larvicided

[3] ID number for sites will be assigned via maps provided by Manitoba Health

[4] Descriptors include one or more of the following: Commercial or industrial; urban; suburban; farm; natural or undeveloped; park or recreational; cemetery, private property; municipal property; fresh water marsh, swamp or bog; large pond or lake; small pond or pit; ditch or sluggish stream; small or large artificial container; other.

[5] **Temporary** – shallow (< 1 foot – 30 cm) lasting 2-6 weeks. Mostly grasses and sedges but can also have reed grasses, whitetop, or rushes where water stays the longest. **Semi-permanent** – 1 – 3 feet (30 cm – 1 metre) in depth lasting through most of season. They often dry up by end of year. Vegetation is mostly cattails but can have bulrush in deeper areas. Generally no open water in middle – generally do not produce mosquitoes early in the spring, but can have multi-voltine (multi-generational) mosquitoes develop later when water warms up. **Permanent** - > 3 feet (1 metre) deep that do not dry up during the season. Emergent deep marsh vegetation (i.e. cattails and bulrush species) and open water in middle with submergent vegetation – can produce some mosquitoes in emergent vegetation zone but an abundance of natural predators can keep populations in check.

APPENDIX D

KEY CONTACT INFORMATION

1. HEALTH LINKS – INFO SANTE

In Winnipeg:	788-8200
Outside Winnipeg:	1-888-315-9257

2. AGRICULTURE: PROVINCIAL VETERINARY SERVICES AND LIVESTOCK ISSUES

Dr. Shelagh Copeland (204) 726-6293 or 945-7652

3. AGRICULTURE: COMMERCIAL BEEKEEPING INDUSTRY

Rheal Lafreniere, Provincial Apiarist (204) 945-4825.

4. PROVINCIAL COORDINATOR, NEW PUBLIC HEALTH PROGRAMS (WEST NILE VIRUS PROGRAM, MANITOBA HEALTH)

Fran Schellenberg (204) 788-6715

5. CONSERVATION: PESTICIDE PERMITS

Ken Plews, Pesticide Approvals (204) 945-7067

6. REGIONAL MEDICAL OFFICERS OF HEALTH

WRHA, MOH	Dr. Margaret Fast	(204) 926-8031
WRHA, MOH	Dr. Pierre Plourde	(204) 926-7079
N. Eastman MOH	Acting MOH	(204) 697-3587
S. Eastman MOH	Dr. Jan Roberts	(204) 346-6140
Assiniboine/Brandon MOH	Dr. Elise Weiss	(204) 571-8395
Parkland MOH	Dr. Anna Johnston	(204) 638-2124
Central MOH	Dr. Shelly Buchan	(204) 428-2018
Interlake MOH	Dr. Tim Hilderman	(204) 697-3587
NorMan MOH	Dr. Lorne Clearsky	(204) 627-8242
Burntwood/Churchill MOH	Dr. Randy Gesell	(204) 778-1494

7. MANITOBA HEALTH WEBSITE

http://www.gov.mb.ca/health/

PART II
MANITOBA HEALTH WEST NILE VIRUS PROGRAM
COST-SHARED FUNDING APPLICATION FOR LARVICIDING

1.0 - INTRODUCTION TO APPLICATION PACKAGE

West Nile virus (WNV) will likely reappear in Manitoba in 2005 and, as in 2004, municipalities can apply for provincial funding that will cover 75% of costs for larviciding activities to reduce the risk of human exposure to WNV. Municipalities are expected to cover 25% of costs.

Typically, the time period that is effective for the control for *Culex tarsalis* larvae is from approximately **mid June/early July to late August. Municipalities will be advised by the Province as to when to commence and when to discontinue WNV related larviciding activities.** These decisions will be made based on preceding mapping and larval sampling/identification undertaken by the Province, as well as other scientific considerations.

Cost estimates for the purposes of applying for 2005 cost shared funding should be based on a maximum of five (5) rounds of larviciding (assuming an average of 14 days between each round), including a **3 km expanded treatment zone** around the targeted community. *Baccillus thuringiensis israelensis* (*Bti*) is the recommended larvicide in Manitoba. (More information on *Bti* can be found on page 7 of this document.) Previous applicants may use their 2004 actual costs per round as a basis to estimate the 2005 cost per round, bearing in mind that any stock of product and/or equipment that was claimed in 2004 is not eligible for reimbursement on the 2005 application. New applicants should contact their respective Regional Team Coordinator for assistance in completing their cost-share applications.

Municipalities are reminded that a successful larviciding program will involve a concerted effort by municipal personnel and provincial Field Surveillance Teams to identify larval development sites within a community.

Municipalities that are applying for cost-shared funding for larviciding will need to describe their plan on the attached application form and submit it to Manitoba Health for approval (A sample plan and budget can be found on page 28 and 29 of this document. Applications will be reviewed by the Mosquito Control Approval Group (MCAG) which will provide recommendations to Manitoba Health.

An application checklist outlining activities to be competed as part of the application process can be found on page 31.

2.0 - FREQUENTLY ASKED QUESTIONS

What does a larviciding program involve?

A larviciding program involves using current maps of standing water of the type in which that *Culex tarsalis* may lay their eggs, to sample and treat sites where *Culex tarsalis* larval is identified. Once a plan is approved for cost-shared funding by Manitoba Health and WNV larviciding has commenced, municipalities are expected to sample (i.e. dip) the sites of standing water to confirm the presence of larvae before treating those sites and to evaluate effectiveness by sampling after larviciding applications. Guidelines for larval sampling and larviciding and a log for tracking larva sampling and larviciding activities can be found on page 15 of this document.

How is the larva sampling/larviciding log used? Do I need to submit larva sampling and larviciding data to Manitoba Health?

When Field Surveillance Teams are in communities for purposes of mapping and mosquito surveillance, they will also assist municipal staff in doing quality assurance, (i.e. assessment of effectiveness of larval treatments). The completed logs will assist municipal and Field Surveillance personnel in this process. Municipalities are required to submit completed templates to Manitoba Health at the end of the season for purposes of broad analysis.

Why do I have to apply for cost shared funding now?

Municipalities are encouraged to apply for cost-shared funding prior to the WNV season so that they are prepared to respond as soon as *Culex tarsalis* lavae are identified in southern Manitoba. Controlling all generations of the larvae is important to the success of a larviciding program.

What costs are eligible for Provincial Cost-Sharing?

The Province's cost-sharing assistance to municipalities will be available only for costs associated with WNV related larviciding activities undertaken in 2005 in accordance with a plan approved by Manitoba Health. The following will be eligible for cost share funding:

- Employee wages for time spent larviciding (this includes larval sampling) during the WNV season (as per direction provided by Manitoba Health)
- Cost of insecticides
- Rental of ATV/truck during the WNV larviciding period
- Purchase of equipment such as a backpack or hand held granular shakers.
- Fuel for vehicle(s) used during larviciding rounds.
- Costs incurred by a municipality to contract an independent third party to conduct the larviciding
- Pesticide permits, licensing, and insurance costs that are purchased specifically for the purpose of WNV-related mosquito control
- Administration costs (to a maximum of 15%) – keeping in mind that cost shared funding is expected to be revenue neutral

What costs are not eligible for Provincial Cost-Sharing?

The following items are not eligible for cost share funding reimbursement:

- Insurance and liability coverage that is purchased/required for other purposes.
- Pesticide permit and/or licensing costs that are purchased/required for other purposes
- The purchase of an ATV or any other vehicle
- Any cost of backpacks, insecticide stock claimed in previous years
- Any larviciding costs incurred outside of the specified WNV larviciding dates directed by Manitoba Health

What are the primary factors that will be considered in making decisions about cost shared funding for larviciding?

Typically, decisions will not be based on any one factor alone, but instead will be a judgement based upon available information and evidence in a particular set of circumstances, including:

- Population density/size of community
- Previous and/or current detection of WNV in an area, including presence and number of positive surveillance indicators, (e.g. *Culex tarsalis* larvae, numbers/infection rates of adult mosquitoes, human cases, WNV positive corvids, etc.)
- Time of year and expected life-cycle of mosquitoes
- Accessibility to standing water

What about costs incurred before the plan is approved?

Only items approved in the plan for the 2005 season will be eligible for cost recovery. Municipalities concerned about cost-sharing may want to wait for approval of their plan prior to incurring costs.

When is the Province's share of the costs going to be paid?

If an application for cost-shared funding is approved, the municipality will be responsible for undertaking the action in their municipality as described in their plan, and to incur the costs, for later reimbursement. A claim for reimbursement of 75% for the actual total costs incurred must be submitted to Manitoba Health, once all activity is complete, but no later than ***October 31, 2005***.

What supporting documents will be required by the Province for the costs to be paid?

If a plan is approved, the municipality will need to submit a ***reconciliation invoicing form*** (included on page 30 of this document) to Manitoba Health, for re-payment of 75% of eligible, approved expenses. ***This reconciliation information is required from all municipalities, even those using third party service providers.*** A summary of details of the mosquito control action, including dates of mosquito control, pesticide use, number of staff, salaries, etc. must accompany the invoice. Municipalities will also be required to submit larval sampling/larviciding logs to Manitoba Health.

If a municipality anticipates exceeding the allotted funding, a supplemental application must be submitted prior to incurring costs. Costs exceeding the amount of the initially approved application may not be supported by the provincial program.

What about cost shared funding for adult mosquito control?

Cost shared funding for adult mosquito control will not be approved until conditions exist that may indicate an imminent risk to human health and a Ministerial Order is issued. The average number of *Culex tarsalis* mosquitoes collected per week, infection rates of those mosquitoes, effectiveness of other mosquito control measures, time of year and weather conditions are some of the factors that are considered in making decisions regarding adult mosquito control. It should also be noted that the Minister may order adult mosquito control in an area, even if no application is submitted, if an imminent risk to human health is identified.

Manitoba Health has contracted with the City of Brandon and the City of Winnipeg to carry out WNV related adult mosquito control in southern Manitoba if this is deemed necessary and if the identified municipality does not have trained personnel to undertake this. If adult mosquito control is carried out by order of the Minister, Municipalities will still be responsible for 25% of the cost.

3.0 - COST SHARED FUNDING APPLICATION FORM

This application should be used by municipalities seeking approval for cost-shared funding for West Nile virus (WNV) related larviciding through the Manitoba Health, WNV Program. Each section of the application should be completed thoroughly in order to be considered for cost-shared funding.

Municipalities are to consult with their Regional Coordinator as necessary to complete this application. Name and contact information of Regional Coordinators can be found on page 5 of this document. Municipalities may fax the completed application to (204) 948-2190. In addition, the original application, along with all supporting documentation, should be mailed directly to:

Manitoba Health – WNV Program
4049-300 Carlton Street
Winnipeg, MB R3B 3M9

NAME OF REGIONAL COORDINATOR:_____

NAME OF REGIONAL TEAM:_____

NAME OF MUNICIPALITY:_____

CAO _____

PHONE NO: _____

ADDRESS: _____

_____

_____

LEAD CONTACT PERSON (if different from above):

NAME: _____

PHONE NUMBER: _____

AFTER HOURS CONTACT: _____

EMAIL: _____

FAX: _____

PROPOSED MOSQUITO CONTROL PLAN

Provide a short description of your proposed mosquito control program for 2005, including:

- **a description of the area where mosquito control is proposed to take place including general identification of specific "hot spots" (i.e. sites of chronic standing water of the type where *Culex tarsalis* mosquitoes may lay their eggs), both on public and private property.**
- **estimated population of proposed larviciding area;**
- **the plan to address mosquito control in a 3 km buffer area around the identified community;**
- **other information/special circumstances (eg. location and/or existence of beekeepers, organic farms, other sensitive areas such as creeks, etc.)**
- **confirm pesticide permits in place**
- **plan for evaluation of success of the control activities:**

2005 Estimated Total Larviciding Budget (based on five rounds)

	Estimated Budget
Personnel Cost Identify service provider and average cost per hour. Identify what the hourly wage includes, (ex. in some instances such as Weed Control Supervisors, cost will include truck rental, gas, etc.)	
Insecticide Cost Identify type of insecticide and amount being purchased.	
Purchase/Rental of Equipment Identify type of equipment being purchased/rented and associated costs.	
Other costs Identify other costs related to larviciding activities, such as gas (if not claimed as part of personnel cost), administration costs, etc.	
Total	
25% Municipal Share	
75% Provincial Share	

Your Regional Team Coordinator will advise you verbally if your application is approved. Manitoba Health will make its best efforts to provide a decision as soon as possible. If you have any questions regarding the status of your application, please contact your Regional Team Coordinator.

Date Submitted:_____

Prepared by (include title): _____

Signature of Preparer: _____

Name of Authorized Officer: _____

Signature of Authorized Officer: _____

For Use by Manitoba Health

Date Application Received:_____

Date Reviewed: _____

Decision: _____

Comments:

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4.0 – SAMPLE: LARVICIDING PLAN AND BUDGET

Community X proposes to undertake a larviciding program within the community and within a 3 km radius of Community X.

Geographic Area – The Community is 3200 acres. The 3km expanded treatment area is 5400 acres. (A map of the area is enclosed) It is proposed to larvicide standing water in ponds and ditches within the city limits and within a 3km radius of the community with specific priority to:

- X creek, cemetery, bypass drain
- Golf course water hazards, ponds, and streams
- Ditches surrounding public playgrounds and parks
- Ditches in residential zones as well as commercial and industrial areas
- Watercourse, streams and agricultural irrigation holding ponds

Estimated population: Population of Community X is approximately 2340; population within the 3km radius of the community is approximately 250.

Proposed dates and times: As defined in the municipal planning document, the public works staff will commence larviciding at the direction of Manitoba Health, i.e. mid to late June, and will cease larviciding at the direction of Manitoba Health, approximately in late August. The public works staff will dip water to confirm the presence of larvae and will apply *Bti* to those sites where larvae are present every 14 days.

Resources: Application will be done by public works staff (one permanent staff and one seasonal). Pesticide permits are in place, and staff are licensed. Previous maps provided by Manitoba Health will be used to identify locations of standing water. Public works staff will work with the Field Surveillance Team to identify any new sites of standing water in the community.

Equipment: Motorized backpack sprayers, pick up truck, Gator,

Product: insecticides (Vectobac)

Plan for Evaluation: Evaluation of the larviciding program will consist of post sampling of larvicided sites. Staff will work closely with the Field Surveillance Teams and will also use the larva sampling/larviciding data collected to assess effectiveness of the larviciding.

SAMPLE:
2005 Estimated Total Larviciding Budget (based on five rounds)[6]

	Estimated Budget
Personnel Cost **(Identify service provider and average cost per hour. Identify what the hourly wage includes, (ex. In some instances such as Weed Control Supervisors, cost will include truck rental, gas, etc.)** 1 staff : 96 hours @$17.30 Assistant: 150 hours @ $10.28 Administration: 15%	 $1660.80 $1542.00 $ 480.42
Insecticide Cost **(Identify type of insecticide and amount being purchased.)** Vectobac 200G @905 kg @ $6.65/kg	 $6,018.25
Purchase/Rental of Equipment **(Identify type of equipment being purchased/rented and associated costs.)** We have a motorized back pack that was purchased last year and we will use our own truck and ATV – no rentals required.	
Other costs **(Identify other costs related to larviciding activities, such as gas, etc.)** Miscellaneous supplies – gas, protective gear, signs	 $1050
Total	$10,751.47
25% Municipal Share	$2687.87
75% Provincial Share	$8063.61

5.0 - WEST NILE VIRUS COST-SHARE LARVICIDING RECONCILIATION FORM

[6] These are not actual costs related to an actual larviciding program. Cost estimates will vary from municipality to municipality based on service provider; area of treatment, etc.

2005 Program Budget (submitted to Manitoba Health and approved) and total Actuals
Dates larvicided: _____

	Budget	Actuals
1. Personnel Cost: **Title** (**No. of Hours**) x **Rate/Hr.)** a) _____ _____ _____ b) _____ _____ _____ c) _____ _____ _____ **Please state what the cost per hour includes (ex. labour, truck rental, gas, etc.)**		
2. Insecticide Cost: **Type** **Bag size/weight (kg)** **No. of Bags** **Cost/bag** a) _____ _____ _____ _____ b) _____ _____ _____ _____		
3. Purchase/Rental of Equipment (ex. backpacks, ATV rental, etc.): **Type** **Cost** a) _____ _____ b) _____ _____ c) _____ _____ d) _____ _____		
4. Other Costs (Please list): a) _____ b) _____ c) _____		
Subtotal		
25% Municipal Share		
75% Provincial Share		
Total 75 % Provincial Share		

6.0 - APPLICATION CHECKLIST:

□ Read introduction to cost share application package and *Supplementary Information for Municipalities*

□ Provided a primary contact name (e.g. Public Works contact/ Weed Control Supervisor)

□ Provided all requested information in the proposed mosquito control plan

□ Discussed proposed plan with Regional Coordinator

□ Signed the application form

□ Received authorization to enter private property (if necessary)

□ Ensured Pesticide Permit in place

□ Ensured larviciding personnel have required license

□ Read the Guidelines for Larva Sampling and Larviciding provided on page 16 of this document and reviewed the template for tracking these activities

□ Ensured process in place for tracking expenditures